"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENTS, L.

Fireproof building in wooded districts of the Ukraine. Pozh. delo 5 no.4:10 Ap '59. (MIRA 12:5)

1. Nachal'nik otdela stroitel'nykh materialov Glavkolkhozstroya Ministerstva sel'skogo khozyaystva USSR.
(Ukraine--Building, Fireproof)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

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FEL', S., inzh.; VILENTS, L., inzh

Interfarm precast reinforced concrete plant. Sil'. bud. 11 no.12: 18-21 D '61. (MIRA 15:2)

(Concrete plants)

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

SAINOV, G. [Sainov, H.]; VILENTS, L. [Vilents', L.], inzh.

Motor transport column of the province interfarm construction organization. Sil'.bud. 12 no.6:18-19 Je '62. (MIRA 15:8)

1. Direktor avtobazy L'vovskogo oblastnogo mezhkolkhozstroya (for Sainov).
(Lvov Province--Collective farms--Interfarm cooperation)
(Transportation, Automotive)

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

GRIN'KO, V. [Hryn'ko, V.]; VILENTS, L., inzh.

We build using production line methods. Sil'. bud. 11 no.9:8-9 S '61. (MIRA 14:11)

1. Rukovoditel' Komishevskoy mezhkolkhoznoy stroitel'skoy organizatsii Zaporozhskoy oblasti (for Grin'ko).
(Zaporozh'ye Province—Construction industry)

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENETS, L.

Small stock-raising town. Sil'. bud. 11 no.10:17 O '61.
(MIRA 14:11)

(Orekhov District--Swine)

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENTS, L.

Why is tile not used in Rovno Province? Sil'. bud. 13 no.2:19-20 F '63. (MIRA 16:2)

1. Glavnyy inzh. otdela po rukovodstvy mezhkolkhoznymi organizatsiyami i stroitel'stvu v kolkhozakh Ministerstva proizvodstva i zagotovok sel'skokhozyaystvennykh produktov UkrSSR.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENTS', L., inzh.; UDOVYTSYA, N., mekhanik

New clay mill for making roofing tiles. Sil'. bud. 7 no.7: 6-7 Jl '57. (MIRA 12:11)
(Ukraine--Clay industries--Equipment and supplies)

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENTS, L.; SUKHOMLIN, Ya.

Fireproof building on Ukrainian collective farms. Pozh.delo 4 no.9: 9-10 S '58. (MIRA 11:9)

1.Nachal'nik otdela stroymaterialov Glavkolkhozstroya Ministerstva sel'skogo khozyaystva USSR (for Vilents). 2.Starshiy inspektor Upravleniya pozharnoy okhrany USSR (for Sukhomlin).
(Ukraine--Collective farms--Fires and fire prevention)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

Vilents, Semen Borisovich

VILENTS, Semen Borisovich; FEDOROV, G.P., red.; FEDOROV, B.M., red.izdatel'stva; BRATISHKO, L.V., tekhn.red.

[Making woodpulp] Proizvodstvo drevesnoi massy. Moskva, Goslesbumizdat, 1957. 295 p. (MIRA 10:12)

(Wood pulp)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENTS, S.B., inzh.

Improving the quality of newsprint. Bum.prom. 36 no.5:4-6 My '61. (MIRA 14:5)

(Newsprint)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

REZTSOVA, Ye.V.; VILENTS, Yu.Ye.

Processing of isoprene rubber in an inert medium. Kauch. i rez. 24 no.11:14-15 '65. (MIRA 19:1)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

L 12805-66 (A) EWT(m)/EWP(j)/EWP(t)/EWP(b) IJP(c) JD/RM

ACC NR: AP5028900 SOURCE CODE: UR/0138/65/000/011/0014/0015

AUTHOR: Reztsova, Ye. V.; Vilents, Yu. Ye.

55
B

ORG: Scientific Research Institute of the Tire Industry (Nauchno-issledovatel'skiy institut shinnoy promyshlennosti)

15,44

TITLE: Processing of isoprene rubbers in inert media

SOURCE: Kauchuk i rezina, no. 11, 1965, 14-15

TOPIC TAGS: isoprene, rubber, argon, thermomechanical property, vulcanization

ABSTRACT: A study was made of the effect of the inert medium (argon) used during processing and mixing on the properties of vulcanizates prepared from NK and SKI-3 isoprene rubbers. The experiments showed that the rate of degradation was substantially reduced by the argon. As the medium is changed from air to argon, the relative viscosity η_0 after 10 min of plastication increases from 3.0 to 9.0 for NK and from 4.1 to 6.4 for SKI-3. This was confirmed by thermomechanical investigations. The inert medium decreases the deformability of the rubber, increases the intermolecular interaction, and shifts the yield temperature from 20 to 60C. The plasticity of NK-base mixtures decreases from 0.803 to 0.678, and that of SKI-3-base mixtures, from 0.837 to 0.742. When the mixtures are processed in argon, the tensile strength of the vulcanizates increases. The mechanism of the processes responsible for this improvement in properties is duscussed. Orig. art. has: 2 figures.

Card 1/2 UDC: 678.762.3-678.023.3:541.12

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L 12805-66

ACC NR: AP5028900 0

SUB CODE: 11 / SUBM DATE: none / ORIG REF: 003 / OTH REF: 005

jw

Card 2/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENSON, B. A.

Method of accelerated decalcification in acid-formalin-potassium solution. Arkh. pat., Moskva 12 no.5:93 Sept.Oct. 1950. (CLML 20:1)

1. Of the Department of Pathological Anatomy (Head -- Prof. P. V. Sipovskiy), Leningrad Stomatological Institute and of the Pathologico-Anatomic Division (Head — Dr. L. M. Linder), Children's Hospital imeni Dr. K. A. Raukhfus, Leningrad.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILENSON, B.A., SHEYDINA, R.B.

Combined affection of the brain and adrenals in a 19-day-old child. Pediatriia 36 no.6:91-92 Je '58 (MIRA 11:6)

1. Iz 2-y Leningradskoy gorodskoy detskoy bol'nitsy.
(NERVOUS SYSTEM--DISEASES)

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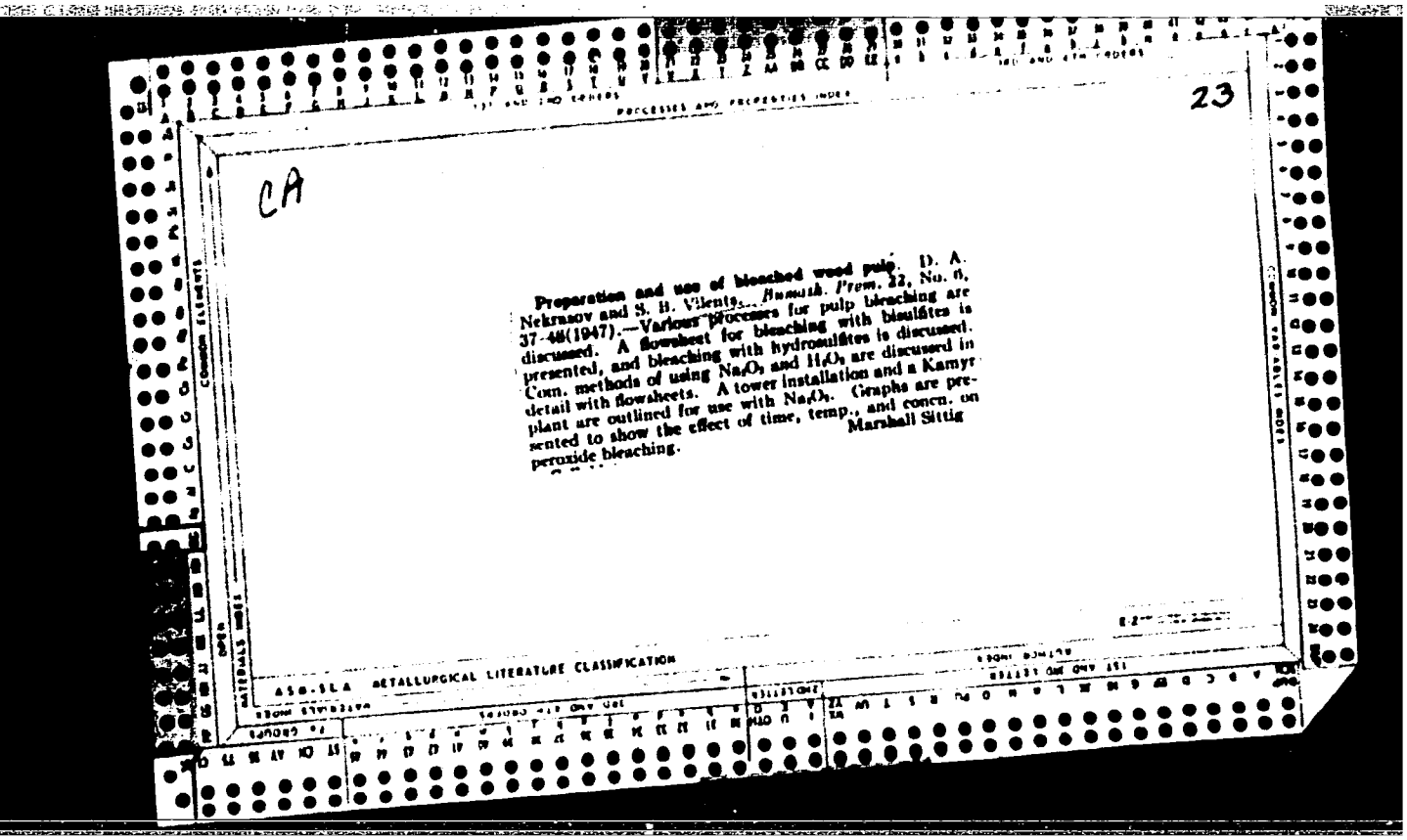

23

CA

Preparation and use of bleached wood pulp. D. A. Nekrasov and S. B. Vilenta. *Bumazh. Prom.* 22, No. 6, 37-48(1947).—Various processes for pulp bleaching are discussed. A flowsheet for bleaching with bisulfites is presented, and bleaching with hydrosulfites is discussed. Com. methods of using Na_2O_2 and H_2O_2 are discussed in detail with flowsheets. A tower installation and a Kamyr plant are outlined for use with Na_2O_2. Graphs are presented to show the effect of time, temp., and concn. on peroxide bleaching.

Marshall Sittig

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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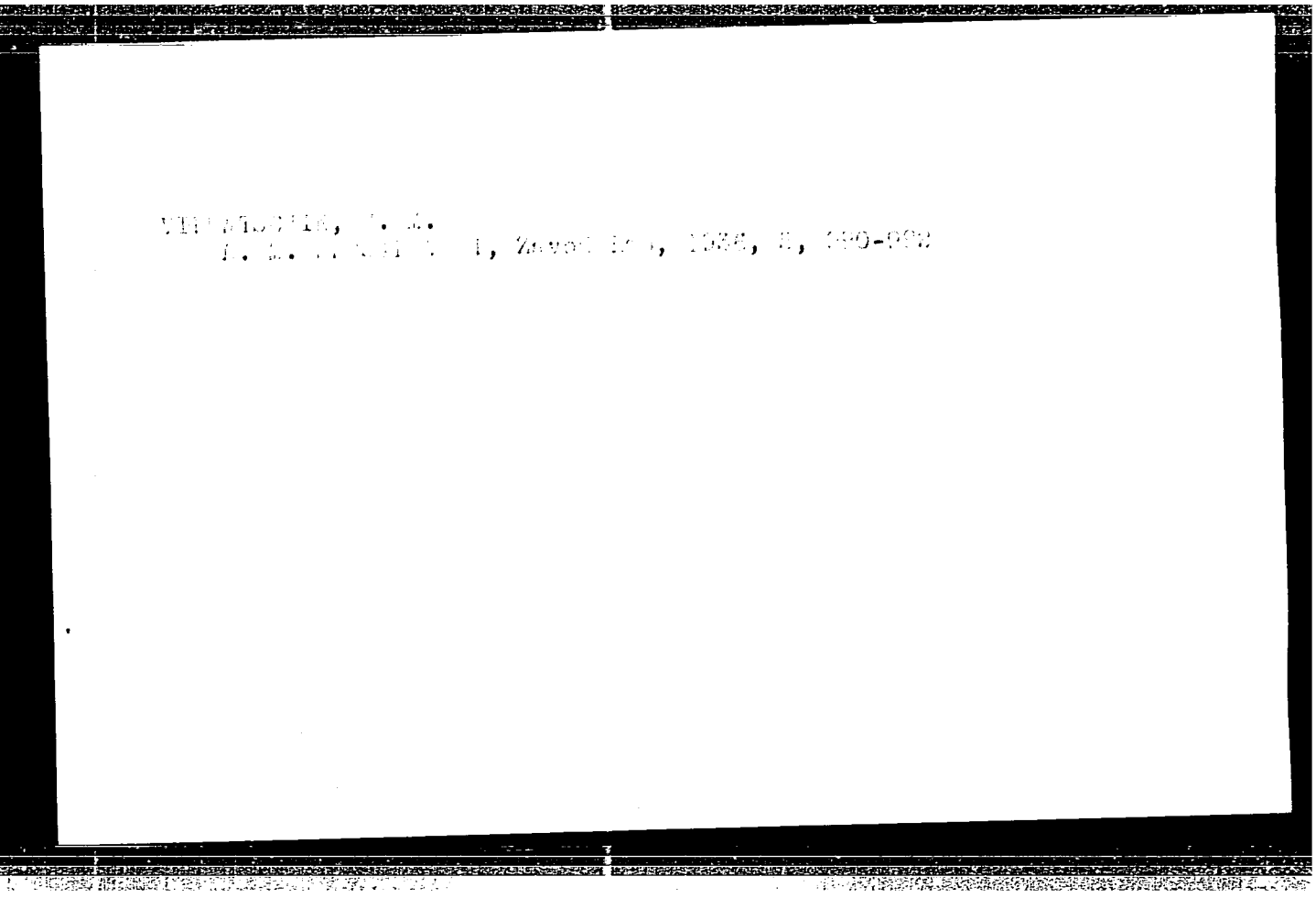

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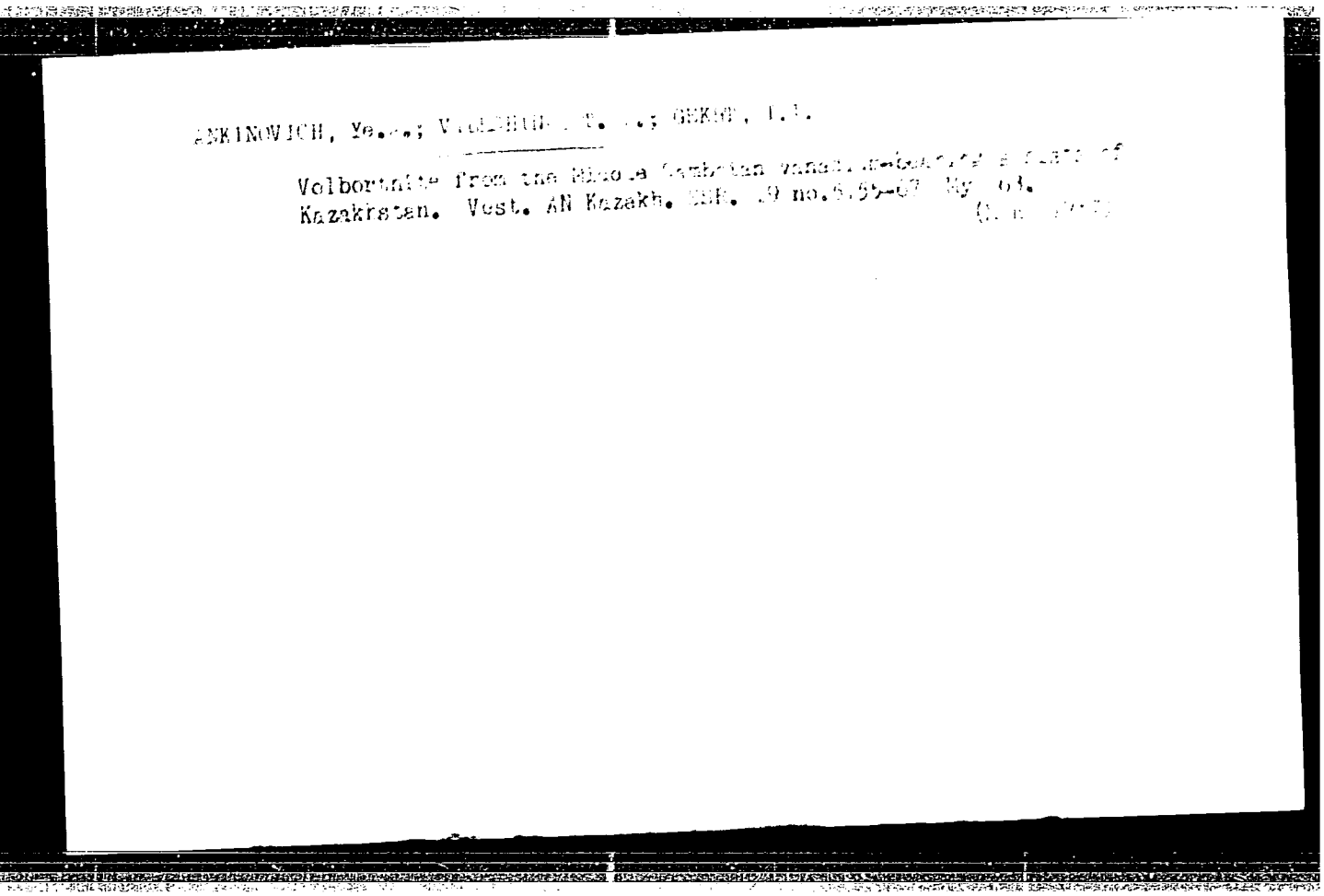

ZENKINOVICH, Ye.A.; V[illegible]; OSKAR, I.I.

Volborthite from the Mirgalimsay deposit in Central Kazakhstan. Vest. AN Kazakh. SSR. 19 no.5:59-67 My '63.
(MIRA 16:6)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

POKROVSKAYA, I.V., GEKHT, I.I., VILESHINA, T.L.

Tetradymite in the trans-Ili Ala-Tau. Izv. AN Kazakh. SSR. Ser. geol. no.1:117-119 '60. (MIRA 13:8)
(Trans-Ili Ala-Tau--Tetradymite)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

SATPAYEVA, T.A.; KOSHEVENKO, M.K.; VILKINA, T.L.

Cobaltine, glaucodot, and a [illegible] in the ores of the Uzbekzhazgan deposit. Izv. AN Kazakh. SSR. Ser. geol. 21 no.4:31-39 Jl-Ag '64. (MIRA 17:11)

1. Institut geologicheskikh nauk AN KazSSR imeni Satpayev, Alma-Ata.

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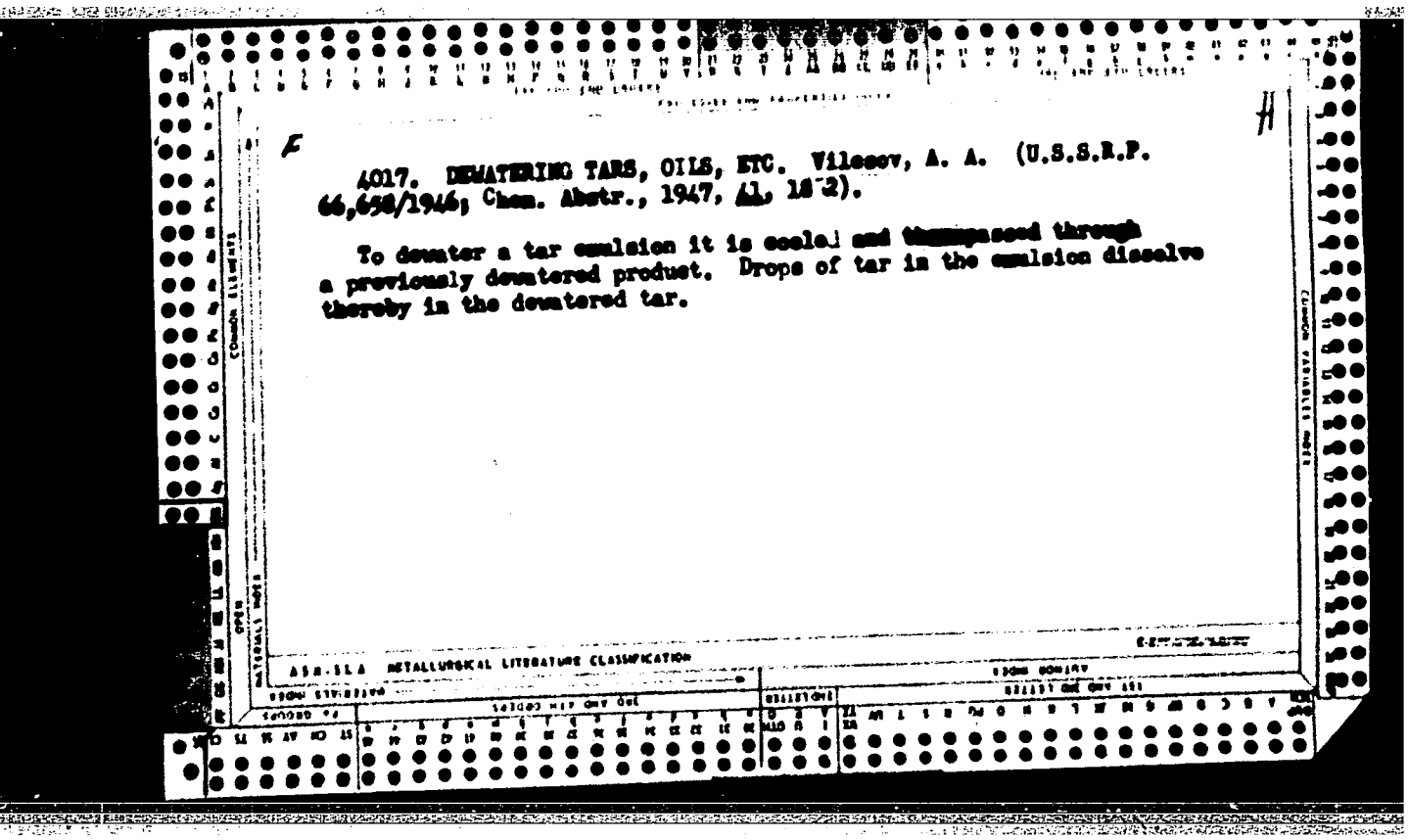

F

4017. DEWATERING TARS, OILS, ETC. Vilesov, A. A. (U.S.S.R.P. 66,658/1946; Chem. Abstr., 1947, 41, 1852).

To dewater a tar emulsion it is cooled and thumpassed through a previously dewatered product. Drops of tar in the emulsion dissolve thereby in the dewatered tar.

H

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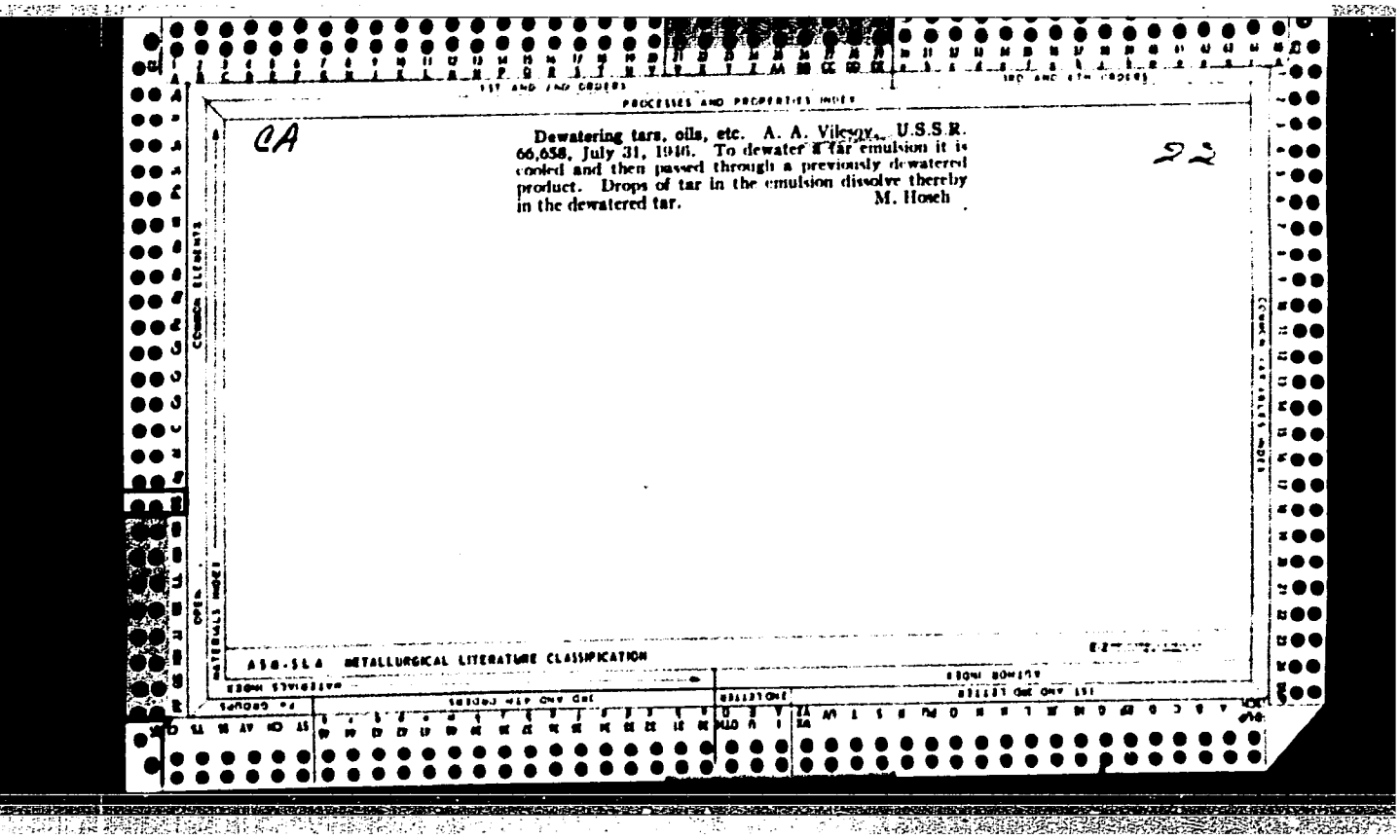

CA

Dewatering tars, oils, etc. A. A. Vikeev, U.S.S.R. 66,658, July 31, 1946. To dewater a tar emulsion it is cooled and then passed through a previously dewatered product. Drops of tar in the emulsion dissolve thereby in the dewatered tar. M. Hoseh

22

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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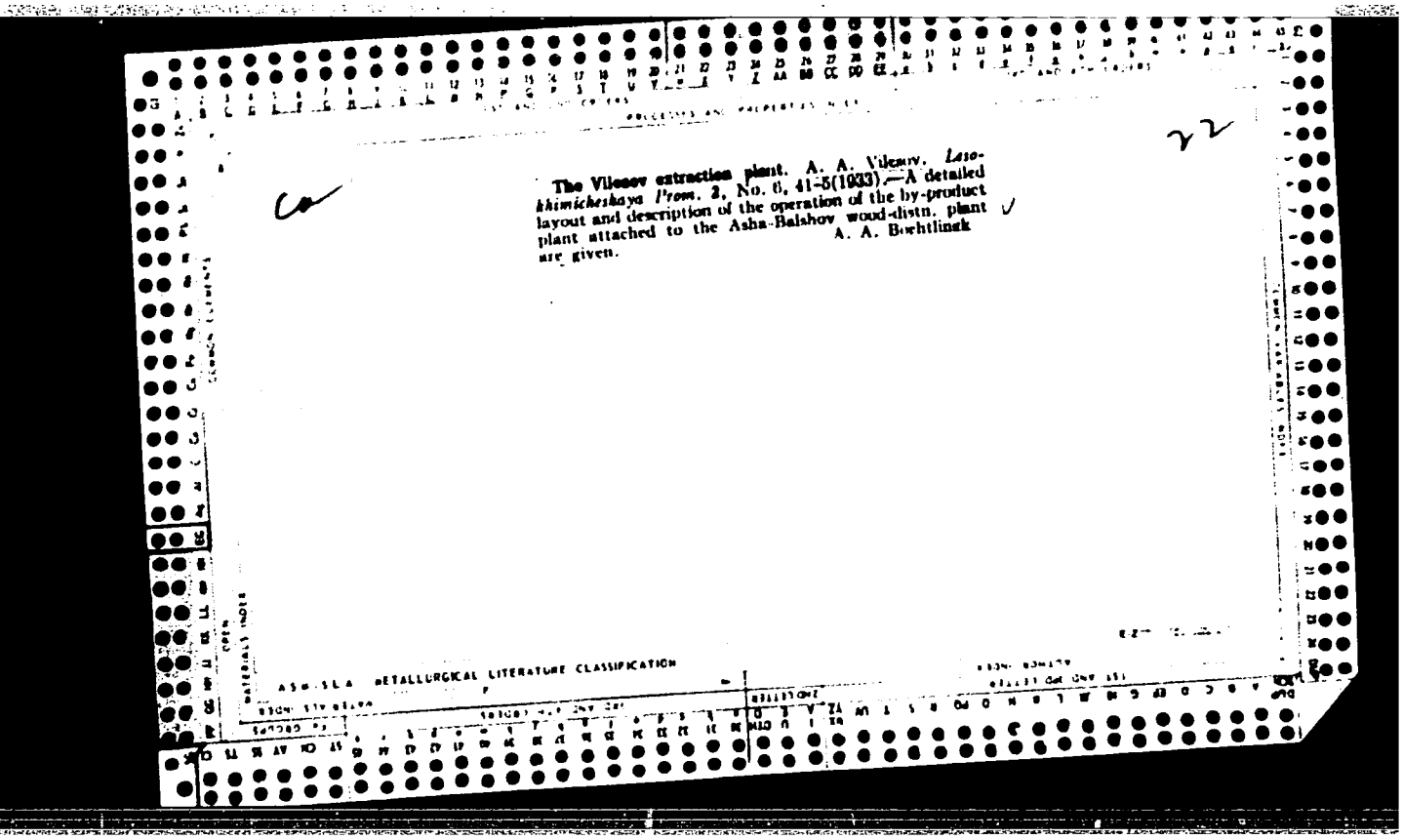
"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0



The Vilesov extraction plant. A. A. Vilesov. *Lesokhimicheskaya Prom.* 2, No. 6, 41-5(1933).—A detailed layout and description of the operation of the by-product plant attached to the Asha-Balashov wood-distn. plant are given.
A. A. Bochtlingk

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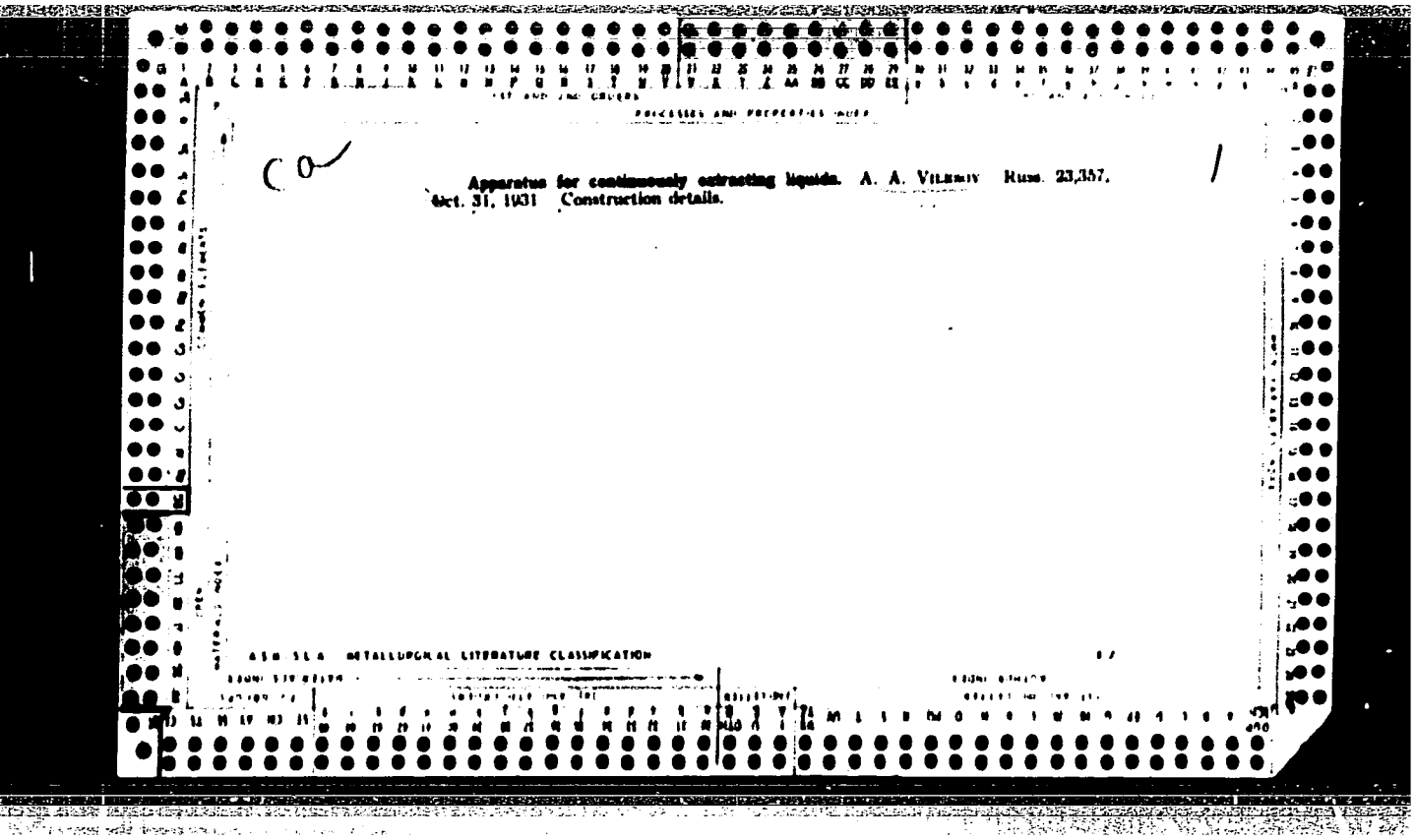
"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0



C 0

Apparatus for continuously extracting liquids. A. A. VILENSKY Russ. 23,357. Oct. 31, 1931 Construction details.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, A.M., podpolkovnik; LYSYY, I.P., kapitan zapasa

What underestimating the force of public opinion leads to.
Vest. protivovozd. obor. no.7:7-12 Jl '61. (MIRA 14:8)
(Military discipline)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, A.M., podpolkovnik

Valuable addition to the "Officer's library" ("Our nation's anti-aircraft forces" by V.P.Ashkerov and others. Reviewed by A.M. Vilesov). Vest.protivovozd.obor. no.1:77-78 Ja '61. (MIRA 14:2)
(Antiaircraft artillery)
(Ashkerov, V.P.) (Zabelok, B.G.)
(Kalugin, Ye. I.) (Shevchenko, L.P.)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, D.V., dotsent, kand.tekhn.nauk (Leningrad); RYABININ, I.A., kand. tekhn.nauk (Leningrad)

Selecting the basic parameters of excitation systems for self-exciting synchronous generators. Elektrichestvo no.3:20-24 Mr '60. (MIRA 13:6)

(Electric generators)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, D.V. (Leningrad)

Determination of the change in potential in self-excited synchronous generators. Izv. AN SSSR. Otd. tekh. nauk Energ. i avtom. no.5:37-42 S-O '59. (MIRA 13:1)
(Electric generators)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, D.V. (Leningrad); RYABININ, I.A. (Leningrad)

Transient operation of a current transformer feeding an active inductive load through a rectifier. Izv.AN SSSR. Otd. tekh. nauk Energ. i avtom. no.1:56-61 Ja-F '61. (MIRA 14:3)
(Electric transformers)
(Transients (Electricity))

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, D.V., kand.tekhn.nauk; VORSHEVSKIY, A.V., inzh.

Experience in differentiating the envelope of an alternating voltage. Elektrichestvo no.10:71-72 O '60. (MIRA 14:9)
(Automatic control)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, D.V., kand.tekhn.nauk, dotsent (Leningrad); RYABININ, I.A., kand. tekhn.nauk (Leningrad)

Method for determining the steady-state short-circuit current of a self-exciting synchronous generator. Elektrichestvo no.6:45-49 Je '61. (MIRA 14:10)

(Electric generators)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

KONSTANTINOV, Vasiliy Nikolayevich: VILESOV, D.V., doktor tekhn. nauk prof., retsenzent; KUZNETSOV, N.A., Laureat Gos. premii, retsenzent; SUPRUN, G.F., doktor tekhn.nauk nauchn. red.; CHFAS, M.A., red.

[Synchronization of marine synchronous generators] Sinkhronizatsiia sudovykh sinkhronnykh generatorov. Leningrad, Sudostroenie, 1965. 289 p. (MIRA 19:1)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, D.V., kand.tekhn.nauk, dotsent (Leningrad)

Indices of the quality of voltage stabilization in autonomous electric power distribution systems. Elektrichestvo no.12:32-36 D '61. (MIRA 14:12)

(Electric power distribution)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

MELESHKIN, Georgiy Aleksandrovich; KHOMYAKOV, N.M., doktor tekhn. nauk, retsenzent; VILESOV, D.V., kand. tekhn. nauk, retsenzent; NESTEROV, Yu.A., nauchnyy red.; KVOCHKINA, G.P., red.; TSAL, R.K., tekhn. red.

[Marine synchronous generators with automatic voltage regulators]Sudovye sinkhronnye generatory s avtomaticheskim reguli-rovaniem napriazheniia. Leningrad, Sudpromgiz, 1962. 275 p. (MIRA 15:10)

(Electric generators) (Electricity on ships)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

YANKO-TRINITSKIY, A.A., doktor tekhn.nauk, prof.; ABRAMOVICH, G.P., inzh. (Gomel'); NEDELKU, V., kand.tekhn.nauk, dotsent; KARPOV, G.V.; VERETENNIKOV, L.P., kand.tekhn.nauk, dotsent (Leningrad); VILESOV, D.V., kand.tekhn.nauk, dotsent (Leningrad); ALYAB'YEV, M.I., doktor tekhn.nauk, prof. (Leningrad)

Equations and fundamental relationships in the theory of synchronous machines. Elektrichestvo no.7:81-85 Jl '62. (MIRA 15:7)

1. Ural'skiy politekhnicheskiy institut imeni Kirova (for Yanko-Trinitskiy). 2. Bukharestskiy politekhnicheskiy institut, Rumyniya (for Nedelku). 3. Institut elektromekhaniki (for Karpov).
(Electric machinery, Synchronous)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, D.V. (Leningrad)

Automatic regulation of the voltage of synchronous generators feeding frequency controlled drives. Izv.AN SSSR.Otd.tekh.nauk. Energ.i avtom. no.2:36-41 Mr-Ap '62. (MIRA 15:4)
(Electric generators) (Electric driving)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, Dmitriy Vasil'yevich; RYABININ, Igor' Alekseyevich; FEDOROV, A.V., red.; SLEPTSOVA, Ye.N., tekhn. red.

[Self-exciting synchronous generators on ships]Sudovye samovozbuzhdaiushchiesia sinkhronnye generatory. Moskva, Voenizdat, 1962. 179 p. (MIRA 15:9)
(Electricity on ships) (Electric generators)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, Dmitriy Vasil'yevich, kand.tekhn.nauk, dotsent;
RYABININ, Igor' Alekseyevich, kand.tekhn.nauk, prepodavatel'

Regulation of self-exciting synchronous generators with consideration of the steady-state conditions of the load. Izv. vys. ucheb. zav.; elektromekh. 3 no.6:93-104 '60. (MIRA 15:5)

1. Voyenno-morskaya akademiya korablestroyeniya i vooruzheniya.
(Electric generators)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

20-4-31/60

AUTHORS Vilesov, F.I. and Terenin, A.N., Academician.

TITLE The Photoionization of the Vapors of Some Organic Compounds.
(Fotoionizatsiya parov nekotorykh organicheskich soyedineniy.)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 4, pp. 744-746 (USSR)

ABSTRACT For works on the electronics of aromatic compounds performed in this (see association!) and in a neighboring laboratory it was necessary to determine the values of the separation energy of electrons in a gaseous state. Photoelectric methods were employed for measuring the ionization potentials of the organic vapors:
1) the condenser method (Watanabe),
2) method of the ionization chamber with a gas amplification,
3) the Geiger counter method.
The method 2) was for the first time used by the authors for this purpose. The Geiger counter method was not employed since 1951, since its results are in bad agreement with those of the condenser method. But the authors construeted a special counter model. This method

CARD 1/3

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

The Photoionization of the Vapors of Some Organic Compounds.

is the most sensitive, since it makes it possible to record every ionization act. A hydrogen high-voltage lamp served as source. The photoionization and transmission spectra were recorded on an automatic recorder type EPP-09. Benzene, toluol and p-xylol were investigated by all three methods. It was found that all three methods yield values of the ionization potentials which lie within the experimental error. For measuring the not easily volatile substances (quinone, phenylhydrazine, phenol etc.) the Geiger counter method was employed. Fig. 1 gives several dependence curves of the ionization flow on the wave length of the acting reaction. From this it may be seen that the quantum yield of the photoionization for aromatic amines near the ionization threshold is considerably smaller than for other compounds. According to the Franke-Kondon principle this must point to the fact that the inter-nuclear distances in the molecules in the corresponding ions vary considerably as regards quantity. The first photoionization potantials obtained by the authors are given in table 1. Figure 2 shows the dependence of the ionization potential of benzene derivatives (curve 1) and of aniline

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The Photoionization of the Vapors of Some Organic Compounds.

(curve 2) on the number of hydrogen atoms which are replaced by the group $--CH_3$. The reduction of these potentials with an increase in the number of replaced hydrogen atoms is connected with the increasing density of the cloud of electrons in the benzene ring. There are 2 figures, 1 table, 3 Slavic references.

ASSOCIATION: Leningrad State University imeni A.A. Zhdanov. (Leningradskiy gosudarstvennyy universitet imeni A.A. Zhdanova)

SUBMITTED: July 26, 1957

AVAILABLE: Library of Congress.

CARD 3/3

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

SOV/120-58-4-19/30

AUTHOR: Vilesov, F.I.

TITLE: A Vacuum Spectrophotometer (Vakuumnyy spektrofotometr)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 4, pp 89-92 (USSR)

ABSTRACT: The range covered is 600-4500 Å with a 100 cm focus diffraction grating (600 lines/mm) used at near-normal incidence, giving a resolution of about 1 Å at a slit width of 0.1 mm. A windowless high-voltage d.c. hydrogen discharge (750 V,1 A) is continuously supplied with purified electrolytic hydrogen. The hydrogen is continuously pumped out throught the slit. Before operation, the pressure in the spectrograph (monochromator) is reduced to (1 to 3) 10^{-5} mm hg. During hydrogen flow the pressure is increased to (2 - 4) 10^{-3} mm hg. A quartz- photomultiplier with the exterior to the photocathode coated with sodium salicylate is used as fluorescent converter in recording the spectra. A loop oscillograph (driven via a special d.c. amplifier) is used. The spectra recording rate can be varied from 5 to 250 Å/min. (See text, p. 91)

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SOV/120-58-4-19/30

A Vacuum Spectrophotometer

The spectrum of hydrogen from 1000 to 1700 Å is shown. The paper contains 5 figures and 2 references.

ASSOCIATION: Fizicheskiy institut LGU
(Physics Institute, Leningrad State University)

SUBMITTED: October 20, 1957.

Card 2/2

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

5(4) SOV/2o-122-1-25/44

AUTHORS: Vilesov, F. I., Kurbatov, B. L., Terenin, A. N., Academician

TITLE: A Mass-Spectrometric Investigation of the Photoionization and of the Photodissociation of the Vapors of Amines (Mass-spektrometricheskoye issledovaniye fotoionizatsii i fotodissotsiatsii parov aminov)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 1, pp 94-96 (USSR)

ABSTRACT: For a detailed investigation of these processes, the authors prepared a mass spectrometer of the 90 degree type, the radius of the central ion trajectory of which was 126 mm. The following gaseous amines were investigated: ammonia NH_3, hydrazine NH_2-NH_2, benzylamine C_6H_5-CH_2-NH_2, aniline C_6H_5-NH_2. The mass spectra found by irradiation of these compounds are given in a diagram. Only an elementary photoionization of the molecules according to the scheme $AB + h\nu \longrightarrow AB^+ + e$ was observed. This result confirms the following assumption, expressed in one of the authors' previous papers. The photoionization current is caused only by the

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

A Mass-Spectrometric Investigation of the Photoionization and of the Photodissociation of the Vapors of Amines

elementary photoionization of the molecules and the ionization processes with a decomposition of the type $AB + h\nu \rightarrow A^+ + B^-$ or $AB + h\nu \rightarrow A^+ + B + e$ are not probable (less than 1 % of the main process). If vapors of aniline and benzylamine are irradiated by electrons of $\sim 11{,}5$ eV, more complicated mass spectra are observed; they are caused by the decay of the molecules into ions. Therefore the application of a photon beam (even if it is not monochromatic) is more advantageous for the mass-spectrometric analyses of complicated organic compounds and their mixtures than the application of an electron beam. The use of monochromatic light permits an additional analysis with respect to the thresholds of the photoionization and the identification of various isomers. Carrying out of the measurements is discussed. The spectra for the vapors of ammonia, hydrazine, aniline and benzylamine are given in a diagram and are discussed in short. These spectra are arguments in favor of the following processes: $NH_3 + h\nu \rightarrow NH_2 + H$, $NH_3 + h\nu_B \rightarrow NH_2^* + H \rightarrow NH_2 + H + h\nu_\Phi$, $NH_2 - NH_2 + h\nu_B \rightarrow NH_2^* + NH_2 \rightarrow NH_2 + NH_2 + h\nu_\Phi$,

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

A Mass-Spectrometric Investigation of the Photoionization and of the Photodissociation of the Vapors of Amines

$C_6H_5 - CH_2-NH_2 + h\nu \longrightarrow C_6H_5-CH_2-NH + H.$

$C_6H_5-CH_2-NH_2 + h\nu \longrightarrow C_6H_5-CH_2 + NH_2.$ The meaning of ν_B and ν_Φ was, apparently, given in a previous paper. No photodissociation of aniline vapors into any kind of radicals was observed. There are 3 figures and 3 references, all of which are Soviet.

ASSOCIATION: Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Physics Institute of Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: May 30, 1958

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, F. I.: Master Phys-Math Sci (diss) -- "Investigation of the photoionization of organic vapors and a study of the effect of adsorption layers on the photoelectric emission of semiconductor catalyst". Leningrad, 1959. 8 pp (Leningrad Order of Lenin State U im A. A. Zhdanov), 150 copies (KL, No 13, 1959, 99)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, F. I.

The Chemical Society of the GDR held its annual meeting 28 Oct.-1 Nov. 1958 in Leipzig. The following papers were presented by the USSR delegation

F. Vilesov and A. Terenin - Physics Inst., LGU "Photoelektronische Emission der Oberflache von Halbleiterkatalysatoren".

Ya. Shilov and A. Yasnikov - Inst. Organic Chemistry, AS USSR "Über den Mechanismus der katalytischen Wirkung von Aminosauren in den Reaktionen der Carbonylverbindungen."

A. Shekhter - Inst. Scientific Information, AS USSR "Zur Elektronenmikroskopie heterogener Katalysatoren."

N. M. Emanuel - Inst. Chemical Physics, AS USSR "Homogene Katalyse und Chemische Induktion bei Langsamen Oxydations-Kettenreaktionen."

A. Ye. Braunshteyn - Inst. Biological & Medical Chemistry, AMS USSR "Allgemeine Fragen der biologischen Katalyse in Licht der Wirkungsweise der Pyridoxalenzyme."

T. Vol'kenshteyn - Inst. Physical Chemistry, AS USSR "Zur Elektronentheorie der Chemisorption und Katalyse an Halbleitern."

V. Kavetskiy and V. Voyevodskiy - Inst. Chemical Physics, AS USSR "Über den Mechanismus einiger katalytischer Reaktionen die an Palladiummetall unter Beteiligung von Wasserstoff erfolgen."

G. K. Borveskov - Karpov Physical-Chemical Inst., Moscow "Wechselwirkung zwischen Katalysator und Reaktionssystem."

A. A. Malamdin - AS USSR "Zum Aufbau einheitstheorie der Katalyse."

SO: Mitteilungsblatt der Chemische Gesellschaft in der DDR, Sonderheft, 1959, Unal.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

24(3), 24(4), 5(4) SOV/20-125-5-25/61

AUTHORS: Vilesov, F. I., Terenin, A. N., Academician

TITLE: The Variation of the Photoelectric Work Function of ZnO, NiO and Cr_2O_3 in the Adsorption of Gases and Vapors (Izmeneniye fotoelektricheskoy raboty vykhoda ZnO, NiO i Cr_2O_3 pri adsorbtsii gazov i parov)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 5, pp 1053 - 1056 (USSR)

ABSTRACT: The authors investigated the photoelectric emission from the surface of ZnO, NiO and Cr_2O_3 before and after the adsorption of several gases and vapors on them, in order to obtain new data concerning the electron-donor-acceptor interaction of molecules with the adsorbents (which are typical semiconductors). Investigation of the photoemission originating from oxide semiconductors meets with some difficulties which are essentially due to the high work function. It was therefore necessary to alter the apparatus formerly (Ref 3) used for this purpose. A vacuum monochromator warranted a monochromatic radiation in the distant ultraviolet spectral range. In the

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

The Variation of the Photoelectric Work Function of ZnO, NiO and Cr_2O_3 in the Adsorption of Gases and Vapors

307/20-125-5-28/61

first series of experiments the adsorbent was located immediately in a counter filled with argon to which the gas to be adsorbed was added. In the case of the second series of experiments the counter was separated from the vacuum cuvette by a vacuum-tight colloid film (thickness 0.1 to 0.2 μ). Measurement of the photoelectric work function from the surface of the zinc oxide in the case of the adsorption of oxygen on it yielded the following main results: For the zinc oxide samples saturated with oxygen, the threshold of photoelectric emission is 7.25 ev. By heating these samples for 20 minutes up to 300 to 350° (under a vacuum) followed by cooling to room temperature, the threshold shifts to 6.7 ev. After repeated heat treatment the threshold shifts further towards the long-wave side of the spectrum, after which it tends towards the limit (6.3 $\pm$ 0.1) ev at 1970 Å. Such a value of the photoelectric work function corresponds to a pure surface of zinc oxide and is determined by the position of the upper level of the filled-up zone. The considerable increase (by ~ 1 ev) of the photoelectric work function from

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

The Variation of the Photoelectric Work Function of ZnO, NiO and Cr_2O_3 in the Adsorption of Gases and Vapors SOV/20-125-3-28/61

the zinc oxide surface in the course of the adsorption of oxygen indicates a negative charge of the surface layer. The dipole layer formed in this connection counteracts the emergence of electrons . A formula for the increase of the work function is written down. The level of the adsorbed ion O_2^- must be 0.2 to 1.2 ev below the bottom of the conductivity zone, which is also in agreement with the results obtained by other investigations carried out in the author's laboratory (Ref 9). These and other results obtained in the present case show that benzene and ethanol are adsorbed on the oxides of zinc and chromium (electron semiconductors) and on nickelous oxide (hole semiconductors) with a certain shifting of the negative charge towards the adsorption centers. The decrease of the work function does not depend on the nature of oxide conductivity and is determined by the nature of the adsorbed molecules and adsorption centers. There are 3 figures and 13 references, 10 of which are Soviet.

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81405

S/020/60/132/06/30/068
B004/B005

5.3200

AUTHOR: Vilesov, F. I.

TITLE: Photoionization of Vapors of Compounds Whose Molecules Contain a Carbonyl Group

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 6, pp. 1332-1334

TEXT: The author investigates the dependence of the positive ionization effect on the structure of aldehydes and ketones. He determines the ionization potentials by a method described in a previous paper (Ref. 2). The data are given in Tables 1 and 2. The author finds that the positive induction effect decreases proportionally to the square distance between methyl- and carbonyl group. This rule does not only apply to saturated ketones with linear structure. In pinacoline and pivoline it was possible to detect additivity if these ketones are interpreted as methyl-substituted acetone. By the example of chloro acetone and dichloro acetone it is shown that the rule also applies to the negative induction effect. Here, the ionization potential increases with increasing substitution by chlorine.

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Photoionization of Vapors of Compounds Whose Molecules Contain a Carbonyl Group

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In amides and acids, the conjunction effect is also noticeable (Diagram). From the summated ionization potentials it was ascertained that the positive conjunction effect prevails in amides, the negative induction effect in acids. The investigation was carried out under the direction of A. N. Terenin, Academician. There are 2 tables and 4 references: 2 Soviet, 1 British, and 1 American.

ASSOCIATION: Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova
(Institute of Physics of Leningrad State University imeni A. A. Zhdanov)

PRESENTED: January 25, 1960, by A. N. Terenin, Academician

SUBMITTED: January 10, 1960

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

83130

S/020/60/133/005/007/019
B019/B054

26.2532

AUTHORS: Vilesov, F. I., Terenin, A. N., Academician

TITLE: Photoelectric Emission From Solid Layers of Organic Dyestuffs

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 5, pp. 1060 - 1063

TEXT: The authors studied the energy distribution of photoelectrons on rhodamine 6G, erythrosine, β-carotene, nonmetallic phthalocyanine, and zinc phthalocyanine. The measurements were made by the method of the retarding field in a spherical condenser. In Fig. 1 the authors show the spectral distribution of the quantum yield of photoelectric emission for erythrosine, rhodamine 6G, and β-carotene in relative units (in the semilogarithmic scale). Figs. 2 and 3 show the energy distribution of photoelectrons of rhodamine 6G- and β-carotene layers for varying photon energies. Table 1 gives the work functions and Fermi levels for all dyestuffs investigated:

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

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Photoelectric Emission From Solid Layers of Organic Dyestuffs

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Dyestuff	Work function	Fermi level
Rhodamine 6G	5.7 ev	4.8 ev
Erythrosine	5.5 ev	5.5 ev
Zinc phthalocyanine	6.0 ev	5.4 ev
Nonmetallic phthalocyanine	6.0 ev	5 0 ev
β-carotene	5.5 ev	5.4 ev

In rhodamine 6G, two groups of electrons were found in the light quantum range of 6.5-10 ev. It is pointed out that neither the thickness of the layer (0.01 - 1.0 μ) nor the manner of its production (sublimation in vacuum or precipitation from any solution) have any effect on the character of energy distribution of electrons or on the work function. The maximum of slow electrons remains, with an increase in the light quantum energy of up to 10 ev, in the same place whereas the maximum of fast electrons shifts in the direction of higher energy. In β-carotene, only the group of slow electrons was found in the energy range of 6.0-9.5 ev; a group of fast electrons appeared only with energies of more than 10 ev. The authors obtained similar results for the other dyestuffs. They refer to analogous energy distributions which other authors obtained for non-

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

Photoelectric Emission From Solid Layers of Organic Dyestuffs

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B019/B054

organic semiconductors. According to the authors of the present paper, the two mechanisms suggested for the explanation of the maximum of slow electrons cannot be applied without additional hypothesis to the dyestuffs investigated here. The authors conclude from the results compiled in the table that the slow electrons are of the same origin in all dyestuffs investigated here. According to the authors' opinion, the energy of the light quanta absorbed is scattered on intramolecular oscillations and electron transitions, which leads to an uncommon photoeffect. Finally, the authors discuss details of light-quantum absorption and electron emission. There are 3 figures, 1 table, and 8 references: 4 Soviet, 2 US, and 2 German.

ASSOCIATION: Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Institute of Physics of Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: May 9, 1960

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9.4176
26.2420

S/020/60/134/001/005/021
B019/B060

AUTHORS: Vilesov, F. I., Terenin, A. N., Academician

TITLE: Photoelectric Emission of Solid Layers of Pinacyanol and Pinakryptol

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 1, pp. 71-73

TEXT: In a previous paper (Ref. 1) the authors had supplied data regarding the photoelectric emission of precipitated layers of rhodamine 6G, erythrosine, metal-free phthalocyanin, zinc phthalocyanin and β-carotin. On the basis of their results they mentioned a possible scattering of light-quantum energy by vibrations and electron transitions inside the molecules. In continuation of their studies the authors used the same experimental arrangement to investigate the photoelectric emission of polycrystalline layers of pinacyanol and pinakryptol. The latter were prepared by precipitation from alcohol solutions on nickel disks. Fig. 1 shows the spectral distribution of the quantum yield of the

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Photoelectric Emission of Solid Layers of Pinacyanol and Pinakryptol

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photoelectric emission of layers of the two compounds examined here. In the photon energy range of 7 - 11 ev, the spectral distributions differ little from the pigments studied earlier. Starting from the photoelectron energy distributions regarding the two substances under examination (Figs. 2 and 3), the authors made use of Einstein's photoeffect formula to determine the work function of the electrons and obtained 4.9 ev for pinakryptol and 5.2 ev for pinacyanol. The low quantum yield of photoelectron emission is ascribed to a low electron density in the filled band or a low probability of its splitting. The latter can be related to a scattering of the quantum energy by intramolecular vibrations. It is pointed out that the energy loss of electrons in pinakryptol is much larger than in other pigments. The energy distributions of photoelectrons for pinacyanol with various photon energies are illustrated in Fig. 3, and are thoroughly discussed. Owing to the occurrence of a peak in the range of low photoelectron energies, variations in photoelectron distribution with various photon energies, and a comparison with results of investigation on inorganic semiconductors, the authors believe that there arise discrete photoelectron energy losses. These discrete energy

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Photoelectric Emission of Solid Layers of Pinacyanol and Pinakryptol

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losses equal the forbidden band width. The authors concede, however, that this view does not easily harmonize with the fact that the photoemission yield also rises somewhat in that photoelectron energy range where the slow electrons exhibit a peak. The results obtained here are finally said to prove that an energy scattering by intramolecular and lattice vibrations is less strong in pinacyanol than in pinakryptol. The two substances studied here have about the same work function for photoelectrons, but exhibit a different photoelectron energy distribution. There are 3 figures and 2 references: 1 Soviet and 1 US.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Scientific Research Institute of Physics of Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: May 30, 1960

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, F. I., TERENIN, A. N., KURBATOV, B. DODONOVA, N. Ya.

"Mass-spectrometry and Luminescence of Radicals in the Photodissociation and photoionization of Molecules by vacuum ultra-violet radiation."

report to be submitted for the IUPAC 21st Conference and 18th Intl. Congress of Pure and Applied Chemistry, Montreal, Canada, 2-22 August 1961.

Leningrad State Univ. im. A. A. Zhdanov

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, F.I.; AKOPYAN, M.Ye.; KLEYMENOV, V.I.

Improvement of the electric and lighting parameters of high-voltage hydrogen lamps. Prib. i tekh. eksp. 8 no.6:150-153 N-D '63. (MIRA 17:6)

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L 20366-65 EWT(l)/EWT(m)/EPF(c)/EPA(w)-2/EWP(j)/EEC(t)/T/EWA(m)-2
Pc-4/Pab-10/Pr-4/Pa-4 IJP(c)/RPL/AS(mp)-2 WW/JW/RH

ACCESSION NR: AP4048042 S/0020/64/158/006/1386/1389

AUTHOR: Akopyan, M. Ye.; Vilesov, F. I.

TITLE The excited states of positive ions and process of dissociative photoionization of aromatic amines

SOURCE: AN SSSR. Doklady*, v. 158, no. 6, 1964, 1386-1389

TOPIC TAGS: aromatic amine, aniline, methylaniline, dimethylaniline, benzylamine, photoionization, positive ion formation, dissociative photoionization

ABSTRACT: The dissociation mechanism of photoionization and the structure of the ion fragments formed upon photoionization, at energies up to 14 ev, of aniline, N-methylaniline, N, N-dimethylaniline and benzylamine were studied. The amino groups of the amines were enriched in deuterium by ion exchange; their photoionization mass spectra were studied and the energy levels of the positive ions were determined. In aniline, with photon energy of about 13 ev, ions with M/e = 66 were formed only by the process

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$C_6H_5NH_2 + h\nu \longrightarrow C_4NH_4^+ + (C_2H_3) + e.$

46% of the C_2H_3 contained 2 hydrogen atoms from the amino groups and one from the ring, 19% had 1 amino hydrogen and 2 from the ring, and 35% had 3 hydrogen atoms from the ring. Substitution of methyl groups for the amino hydrogens caused little change in the lower excitation levels of ions of the conjugated system in aniline, but did affect ionization at energies above 11 ev. Thus hydrogen was split from the molecular ions in higher yields (50% for the methyl- and 60% for the dimethylamine), but it was split off from the methyl groups only, and not from the amino groups. $C_6H_5NH^+$ ions were not detected in the mass spectra of the photoionization of aniline or methylaniline. In benzylamine the hydrogen split from the methylene and not from the amino groups:

$C_6H_5CH_2ND_2 + h\nu \longrightarrow C_6H_5CHND_2 + H + e.$ In addition the following dissociative ionizations were observed: in 2, 3 and 7% yields, respectively: $C_6H_5CH_2ND_2 + h\nu \longrightarrow C_7H_7 + ND_2 + e$ (N-C bond rupture);

$C_6H_5CH_2ND_2 + h\nu \longrightarrow C_5NH_2D_2 + (C_2H_5) + e$ (both hydrogens of the amino group remained in the charged fragment);

$C_6H_5CH_2ND_2 + h\nu \longrightarrow CH_2ND_2 + C_6H_5 + e$ (C-C bond rupture).

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ACCESSION NR: AP4048042

Thus in benzylamine, one of the π-electrons of the benzene ring was split off at the lower ionization potential, but at energies above 9.5 ev ionization processes are caused primarily by absorption in the amino groups. Orig. art. has: 1 table, 4 figures and 9 equations

ASSOCIATION: Leningradskiy gosudarstvenny*y universitet im. A. A. Zhdanova (Leningrad State University)

SUBMITTED: 05May64 ENCL: 00

SUB CODE: OC, EM NO REF SOV: 003 OTHER: 006

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

L 32083-66
ACC NR: AP6020950 SOURCE CODE: UR/0054/66/000/002/0040/0044

AUTHOR: Vilesov, F. I.

ORG: none

TITLE: Spectrophotometric detectors of oxygen and water vapor in air

SOURCE: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 2, 1966, 40-44

TOPIC TAGS: gas analysis, spectrophotometric analysis, laboratory optic instrument, uv filter, oxygen gas analyzer, water vapor analyzer, oxygen detector, water vapor detector

ABSTRACT: Ultraviolet light emitters and ultraviolet absorption detectors in vacuum have been designed and constructed for quantitative determination of oxygen and water vapor in air. Spectrophotometric determination was based on the well-known selective absorption of optical radiation by a given component of the gas mixture. The absence of selective light emitters and detectors precluded an earlier application of this analytical procedure in vacuum, where ultraviolet absorption bands of oxygen and water vapor have maximum intensity and do not overlap with the absorption bands of other air components. A

Card 1/2 UDC: 543.272.1+543.275.1

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newly developed emitter, a compact resonance xenon lamp, and an absorption detector, a vacuum NiO photocell, both with sapphire or lithium fluoride light filters were described for determination of oxygen. Lamps with sapphire windows emitted purer and more stable radiation (1470 Å) and detectors with sapphire windows were much more selective in respect to oxygen than those with lithium fluoride windows. However, the electric signal from the detector was decreased by more than three orders of magnitude with ordinary sapphire windows. A strictly logarithmic dependence was established between the magnitude of the detector signal and partial pressure of oxygen. Sensitivity of oxygen detection may be increased by modifying the gap between windows. A hydrogen-neon light emitter and a small photoionization chamber as the absorption detector filled with nitrogen oxide or carbon disulfide were developed for water vapor determination. The lamp with a lithium fluoride filter emitted an L_α-resonance line (1215.7 Å) of hydrogen. The resonance line detector had a tin oxide cathode. A logarithmic dependence was established between the magnitude of detector signal and partial pressure of water vapor. Sensitivity of determination may be controlled by varying the thickness of the absorption layer (the gap between windows). The interference of oxygen with the L_α line absorption was no more than 3%. Orig. art. has: 8 figures. [JK]

SUB CODE: 07/ SUBM DATE: 31Jan66/ ORIG REF: 004/ OTH REF: 010/
ATD PRESS: 5022

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L 16129-66 EWT(m)/EWP(j) RM

ACC NR: AP6004181 SOURCE CODE: UR/0076/66/040/001/0125/0133

50
49
B

AUTHOR: Akopyan, M.Ye.; Vilesov, F.I.

ORG: Leningrad State University im. A.A. Zhdanov (Leningradskiy gosudarstvennyy universitet)

TITLE: Mass-spectrometric study of photoionization of benzene derivatives in the spectral region up to 885 A

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 1, 1966, 125-133

TOPIC TAGS: mass spectrometry, benzene, toluene, xylene, ionization potential, photoionization

ABSTRACT: The photoionization of benzene, toluene, p- and m-xylene, ethylbenzene, benzyl chloride, and 1,35-cycloheptatriene was studied in the spectral range up to 885 Å. Photoionization mass spectra were recorded at photon energies of 10.2 and 13 eV. For the main ions, dependences of the ion current on the wavelength of the ionizing radiation were determined, and curves of photoionization efficiency were plotted. These curves were used to determine the ionization potentials of the molecules and appearance potentials of the charged fragments. It was shown that the second threshold of formation of molecular ions of benzene methyl derivatives corresponds to the formation of ions in an

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L 16129-66

ACC NR: AP6004181

electron-excited state, the excitation being caused by removal of a π electron during ionization from the filled MO ground state. C_7H_7 ions at the formation thresholds were found to be tropylium ions in the case of ionization of benzene alkyl derivatives and benzyl ions in the photoionization of benzyl chloride. Orig. art. has: 6 figures and 4 tables.

SUB CODE: 07,20/ SUBM DATE: 01Oct64 / ORIG REF: 006 / OTH REF: 030

Card 2/2 SM

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

ACC NR: AP7005587 SOURCE CODE: UR/0020/67/172/002/0371/0374

AUTHOR: Akimov, I. A.; Bentsa, V. M.; Vilesov, F. I.; Terenin, A. N. (Academician)

ORG: none

TITLE: Photoemissive effect from dyes adsorbed on ZnO and mechanism of spectral sensitization

SOURCE: AN SSSR. Doklady, v. 172, no. 2, 1967, 371-374

TOPIC TAGS: photoconductivity, zinc oxide

ABSTRACT: A study of the cyanine dyes 3,3'-diethyl-9,11,15,17-bis(β,β'-dimethyltrimethylene)thiapentacarbocyanine iodide (I) and 3,3'-diethylthiapentacarbocyanine iodide (II), used as spectral sensitizers of silver halide photographic emulsions, was carried out by determining the spectral distribution of the photoconductivity of ZnO containing the dyes and the spectral distribution of the quantum yield of photoelectron emission from ZnO layers before and after introduction of the dyes. The dyes were found to sensitize the photoconductivity of ZnO with a high degree of effectiveness. The results obtained permit one for the first time to compare the position of the electronic energy levels of a semiconductor and a dye in an attempt to provide an explanation for the mechanism of spectral sensitization (Fig. 1). Orig. art. has: 4 figures.

SUB CODE: 07/ SUBM DATE: 21Jun66/ ORIG REF: 004/ OTH REF: 007

Card 1/2 UDC: 535.215

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

ACC NR: AP7005587

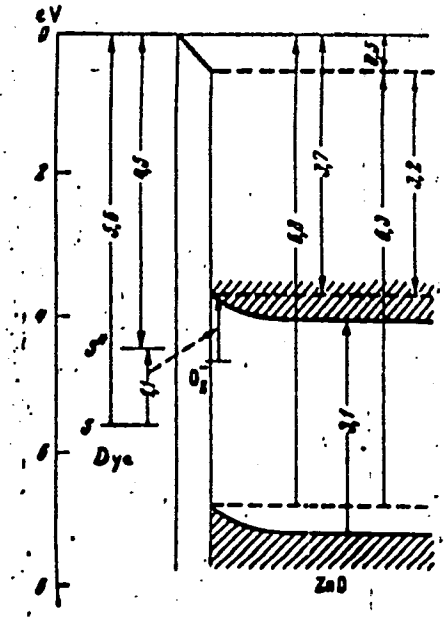

Fig. 1. Diagram of electronic energy levels of zinc oxide and a sensitising dye adsorbed on it

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

L 2204-66 EWT(1) IJP(c)

ACCESSION NR: AP5017332 UR/0181/65/007/007/2232/2234

AUTHOR: Vilesov, F. I.; Zagrubskiy, A. A.; Zelikin, Ya. M.

TITLE: Excitation of fluorescence of zinc oxide by "hot" photoelectrons generated by vacuum ultraviolet radiation

SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 2232-2234

TOPIC TAGS: zinc oxide, fluorescence, uv radiation, electron bombardment, photoelectron

ABSTRACT: This is a continuation of earlier investigations in the 1600--1000 Å range (DAN SSSR v. 141, 1068, 1961), but extended to the 4000--8500 (3.0--14.5 ev) range. The purpose of the investigation was to identify the mechanism responsible for the decrease in the kinetic energy of the primary photoelectrons. The samples investigated were dense polycrystalline sublimated layers of zinc oxide prepared by a method described earlier (PTE no. 2, 130, 1962). The excitation spectra were likewise obtained with previously described apparatus. The measured spectrum consists of three peaks at photon excitation energies 3.5 ± 0.2, 7.5 ± 0.2, and 10.8 ± 0.2 ev, and 3 minima at 6.4 ± 0.2, 9.4 ± 0.2, and 12.8 ± 0.2 ev. The main feature of this spectrum is the fact that the peaks are equidistant, with the energy difference equal to the width of the forbidden band (3.2 ev). Such a spectrum can

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ACCESSION NR: AP5017332

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be attributed to impact ionization of the valence electrons in the conduction band by the primary electrons which have sufficient kinetic energy. The results indicate also that the quantum yield of the fluorescence of the zinc oxide is increased by the impact ionization of the valence electrons when excited with vacuum ultraviolet. This agrees with the universally accepted opinion that the effective mass of the hole in zinc oxide is much larger than the effective mass of the electron. Orig. art. has: 1 figure.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: 15Feb65 ENCL: 00 SUB CODE: SS, OP

NR REF SOV: 008 OTHER: 001

Card 2/2 DP

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

AKOPYAN, M.Ye.; VILESOV, F.I.

Mass spectrometer study of the photoionization of low-volatility organic substances. Dokl. AN SSSR 161 no.5:1110-1113 Ap '65. (MIRA 18:5)

1. Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A.A.Zhdanova. Submitted October 14, 1964.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

LISACHENKO, A.A.; VILFSOV, F.I.; TERENIN, A.N., akademik

Mass spectrometric study of photosorption processes in the oxygen - zinc oxide system. Dokl. AN SSSR 160 no.4:864-866 F '65. (MIRA 18:2)

1. Leningradskiy gosudarstvennyy universitet.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

L 53903-65 EWA(j)/EWT(m)/EWA(b)-2 RM

ACCESSION NR: AP5011535 UR/0020/65/161/005/1110/1113

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25
8

AUTHORS: Akopyan, M. Ye.; Vilesov, F. I.

TITLE: Mass spectrometric investigation of photoionization of relatively nonvolatile organic compounds

SOURCE: AN SSSR. Doklady, v. 161, no. 5, 1965, 1110-1113

TOPIC TAGS: photoionization, mass spectrometry, amino acid, anthracene

ABSTRACT: This paper represents the first attempt to extend the mass spectrometric method to investigations of photoionization of relatively nonvolatile compounds. Compounds considered are anthracene, uracil, thymine, and several amino acids (glycine, alpha and beta alamine, and beta phenylalamine). The setup for the experimental work was previously described by the authors (DAN, 158, 1386, 1964). Samples were evaporated in the immediate vicinity of the photoionization region. Temperature of the crucible was selected to provide a stable ionic current, after 1.5-2 hours, on the order of 10^{-16} amp at a photon energy of 10.2 ev. Curves of photoionization efficiency have been plotted for the various compounds, and it was found that the ionization yield at the threshold of molecular ion formation is very small. This is characteristic of several other compounds

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containing the amino group. By analogy it appears that photoionization of amino acids is associated with the removal of one electron of the unshared pair in the nitrogen atom. The low ionization yield near the threshold may be due to change, during ionization, in nature of hydridization of electrons of the unshared pair with sigma-bonding electrons, leading to a change in interatomic distance. Dissociative ionization of amino acids confirms this view. The curves of photoionization efficiency indicate that the molecular ions of amino acids in excited electron states, forming during photoionization, as well as ions in the ground state, break down almost completely and form splinter ions. The authors conclude that their studies on photoionization energies confirm the general picture of amino acid fragmentation during formation of mass spectra of electron impact. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Physical Institute, Leningrad State University)

SUBMITTED: 29Sep64 ENCL: 00 SUB CODE: GP, EM

NO REF SOV: 004 OTHER: 008

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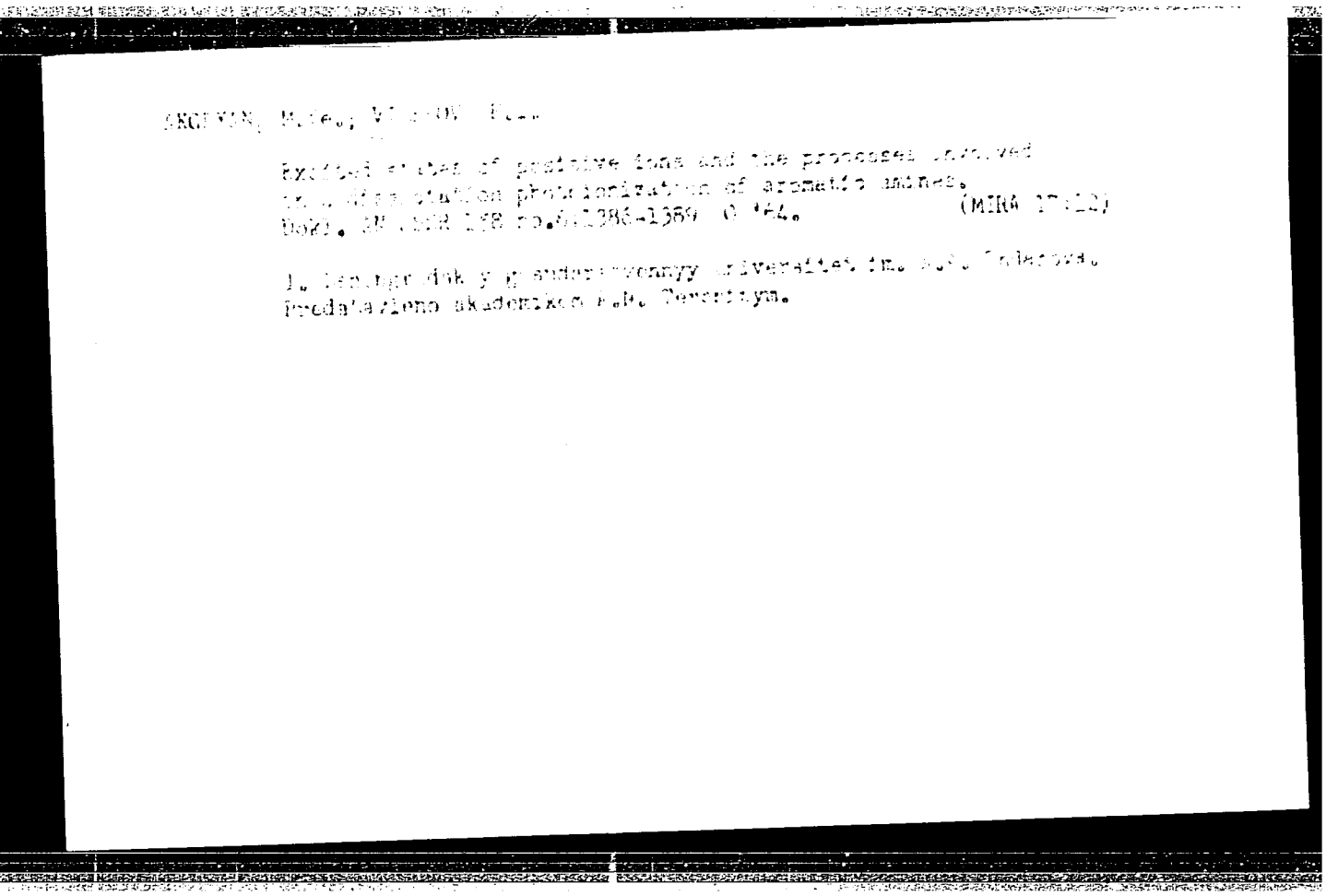

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

ACCESSION NR: AP4012973 S/0020/64/154/004/0886/0889

AUTHOR: Vilesov, F. I.; Zaytsev, V. M.

TITLE: Photoionization of phenyl derivatives of elements of the 5th group.

TOPIC TAGS: diphenylamine, triphenylamine, triphenylphosphine, triphenylarsine, triphenylstibine, triphenylbismuth, photoionization, ionization potential, group 5 element ionization

SOURCE: AN SSSR. Doklady*, v. 154, no. 4, 1964, 886-889

ABSTRACT: The photoionization of diphenylamine and triphenyl-amine, -phosphine, -arsine, -stibine, and -bismuth was studied in the gas phase (200-250C) in the 1500-1800 Angstrom range. The effectiveness of the ionization in the vicinity of the threshold of ion formation varies strongly within this group of elements (fig. 1). The change in ionization potential, the magnitude of the dipole moment and the ability to form some complexes decreases from P, to As, to Sb, to Bi. The ionization potential for triphenylamine is even less. The alkylamines

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are believed to have a planar structure, the triphenyl-group 5 element compounds, a trigonal pyramidal shape. The higher stability of the pyramidal form for the heavier analogs is explained by the appearance of the p-d hybridization, since the d-electrons are more easily accessible to P and the heavy elementsthan in nitrogen. The data and their discussion show that the main ionization potential of the group 5 element-triphenyl derivatives is determined by the separation of one of the unshared pair of electrons of the central atom. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Physics Institute, Leningrad State University)

SUBMITTED: 24Jun63 DATE ACQ: 26Feb64 ENCL: 01

SUB CODE: PH NO REF SOV: 005 OTHER: 015

Card 2/3

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, F.I.; ZAYTSEV, V.M.

Photoionization of the phenyl derivatives of elements of the 5th group. Dokl. AN SSSR 154 no.4:886-889 F '64. (MIRA 17:3)

1. Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A.A. Zhdanova. Predstavleno akademikom A.N. Terenin'm.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

ACCESSION NR: AP4006702 S/0053/63/081/004/0669/0738

AUTHOR: Vilesov, F. I.

TITLE: Photoionization of gases and vapors by vacuum UV irradiation

SOURCE: Uspekhi fiz. nauk, v. 81, no. 4, 1963, 669-738

TOPIC TAGS: photoionization, ionization potential, photoionization efficiency, photoionization yield

ABSTRACT: The present article is a review of research on photoionization in vapors and gases by one of the top Soviet experts in this field. It is based on 254 references, some 10% of them Soviet, published prior to the middle of 1961. An adequate summary is given of research by the Soviet group headed by Vilesov and Terenin on the determination of ionization potentials of organic molecules by the photoionization method and related problems. The ionization potentials of 417 different molecules and free radicals determined by the photoionization, spectroscopic, and electron-impact methods or calculated semiempirically are tabulated. The section on photoionization cross sections is based entirely on a review by G. L. Weissler

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(Hand. d. Phys. v. 21, 304 (1956)). The major subjects covered in the review are as follows: qualitative methods for the investigation of photoionization, variation of the photoionization efficiency near the threshold for the appearance of ions, the semiempirical method for the calculation of ionization potentials of organic molecules, photoionization cross sections, the dependence of first adiabatic ionization potentials on the molecular structure, the ionization potentials and electronic absorption spectra of organic compounds, the mass spectroscopic studies of photoionization processes, and the distribution of electrons according to their kinetic energies during the photoionization of aromatic compounds (the latter research conducted exclusively by Vilesov's group). Orig. art. has: 26 figures and 18 tables.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 09Jan64 ENCL: 00

SUB CODE: PH NO REF SOV: 026 OTHER: 228

Card 2/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, F.I.; KURBATOV, B.L.

Energy spectra of electrons detached in molecular photoionization. Izv. AN SSSR. Ser. fiz. 27 no.8:1088-1093 Ag '63. (MIRA 16:10)

1. Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A.A.Zhdanova.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

AKOPYAN, M.Ye.; VILESOV, F.I.; TERENIN, A.N.

Mass-spectrometric study of the photoionization of molecules and the decay of excited molecular ions. Izv. AN SSSR. Ser. fiz. 27 no.8:1083-1087 Ag '63. (MIRA 16:10)

1. Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A.A.Zhdanova.

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L 18140-63 EPF(c)/EWT(l)/EWT(m)/BDS/ES(w)-2 AFFTC/ASD/ESD-3/IJP(C)/SSD
Pr-4/Pab-4 RM/WW/JW/MAY S/0048/63/027/008/1083/1087
ACCESSION NR: AP3004506

AUTHOR: Akopyan, M.Ye.; Vilesov, F.I.; Terenin, A.N.

TITLE: Mass-spectrometric investigation of photoionization of molecules and disintegration of excited molecular ions /Report presented at the Second All-Union Conference on the Physics of Electronic and Atomic Collisions held in Uzhgorod 2-9 Oct 1962/

SOURCE: AN SSSR, Izvestiya, ser.fiz.,v.27, no.8, 1963, 1083-1087

TOPIC TAGS: photodissociation, photoionization, ionization threshold, hydrazine, hydrazine derivative

ABSTRACT: The paper gives some of the results obtained in investigating photoionization of some alkyl derivatives of hydrazine. An extensive sereis of derivatives were studied, but curves characterizing the efficiency of different ionization processes as a function of the photon energy are given only for methyl- and n-butylhydrazine. The experiments were carried out by means of a set-up consisting of an MI-1305 mass spectrometer coupled to an MV-3 vacuum monochromator. In the course of photoionization of complex molecules (such as hydrazine derivatives) a number of different processes occur, leading to dissociation and the formation of different

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ions. Mass-spectrometric study of the products of photoionization of alkyl derivatives of hydrazine showed, however, that in the case of these molecules dissociative ionization processes play a significant role, and in the case of the more complex molecules becomes predominant. Frequent references are made to the literature and data on photoionization of other compounds, such as ammonium and alkylamines, and some of the present results are tentatively interpreted on the basis of the literature data. It is shown that in the case of hydrazine and its derivatives, as in the case of alkylamines, for example, there is a definite photoionization threshold (located at about 7.6 eV for hydrazine derivatives), below which photoionization falls off to zero. For the more complex molecules there is a definite break in the ionization efficiency versus photon energy curve at about 7.7 eV (no breaks were observed in the investigated energy range for the simpler molecules). The bond rupture energies and photoionization thresholds for hydrazine and some of its derivatives are tabulated. More detailed data will be published elsewhere (M.Ye.Akopyan and F.I.Vilesov, Kinetika i kataliz,4,39,1963).Orig.arg.has: 3 formulas, 4 figures and 2 tables.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

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ACCESSION NR: AP3004506

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institute Leningradskogo gos. universiteta im.A.A.Zhdanova (Scientific Research Institute of Physics, Leningrad State University)

SUBMITTED: 00 DATE ACQ: 26Aug63 ENCL: 00

SUB CODE: PH, CH NO REF SOV: 004 OTHER: 008

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

VILESOV, F.I.; ZAGRUBSKIY, A.A.; GALBUZOV, D.Z.

Extrinsic photoeffect from the surfaces of organic semiconductors. Fiz. tver. tela 5 no.7:2000-2006 Jl '63. (MIRA 16:9)

1. Leningradskiy gosudarstvennyy universitet.
(Organic compounds—Photoelectric properties)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

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L 18139-63 EWP(j)/EPF(c)/EWT(l)/EWT(m)/BDS/ES(w)-2 AFFTC/ASD/IJP(c)/SSD
Pc-4/Pr-4/Pab-4 RM/WW/JW S/0048/63/027/008/1088/1093
ACCESSION NR: AP3004507

AUTHOR: Vilesov, F.I.; Kurbatov, B.L.

TITLE: Energy spectra of electrons detached in photoionization of molecules /Report presented at the Second All-Union Conference on the Physics of Electronic and Atomic Collisions held in Uzhgorod 2-9 Oct 1962/

SOURCE: AN SSSR, Izvestiya, ser.fiz., v.27, no.8, 1963, 1088-1093

TOPIC TAGS: photoionization, electron energy, electron detachment, aniline, naphthalene, benzene, toluene, xylene, mesitylene, durene

ABSTRACT: Although the adiabatic ionization potentials of most atoms and many molecules have been determined by a spectroscopic method (W.C.Price, Chem.Rev., 41, 257, 1947) and the method of photoionization (K.Watanabe, J.Chem.Phys., 26, 542, 1957 and K.Watanabe and others, J.Quant.Spectr.Rad.Trans., 2, 369, 1962), it is not known how the excess energy of the photon (over and above the ionization potential) is divided between the positive ion and the detached electron. Accordingly, the purpose of the present work was to determine this by investigating the energy distribution of the detached electrons by the retarding field technique. The radiation from a hydrogen discharge tube was monochromatized by a one-meter monochromator

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its intensity was measured by means of a fluorescent screen viewed by an FEU-19 photomultiplier. The ionization cell, consisting of three coaxial copper cylinders, is diagramed in Fig.1 of the Enclosure. The inner thick-walled cylinder 2 formed the ionization chamber proper; this electrode was provided with a set of 0.5 mm wide slits normal to the cylinder axis. Measures were taken to insure homogeneity of the electric field. The set-up had provision for simultaneous measurement of the incoming UV flux and the photoionization current as a function of the wavelength. In the present experiments there were obtained current-voltage (retarding potential) curves for aniline, methylaniline, dimethylaniline, naphthalene, benzene, toluene, ortho-, para- and meta-xylenes, mesitylene, and durene (the family of C-V curves for naphthalene is shown in the figure). The experimental points were obtained at photon energy intervals of 0.3-0.5 eV up to 11.7 eV, the cut-off energy of the lithium fluoride window. From these curves there were deduced the energy spectra of the electrons (the curves for aniline, naphthalene and meta-xylene are reproduced). The behavior of the different compounds is discussed briefly; the photon energies corresponding to the appearance of slow electrons are noted. It is inferred that the photoionization mechanism probably involves ejection of more strongly bound valence electrons (rather than ejection of the most weakly bound electron and excitation of one of the valence electrons). Orig.art.has: 5 figures.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

L 18139-63
ACCESSION NR: AP3004507

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im.A.A.Zhdanova (Scientific Research Institute of Physics, Leningrad State University)

SUBMITTED: 00 DATE ACQ: 26Aug63 ENCL: 01

SUB CODE: PH NO REF SOV: 004 OTHER: 005

Card 3/4

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001859810018-0

S/195/63/004/001/002/009
E075/E436

AUTHORS: Akopyan, M.Ye., Vilesov, F.I.

TITLE: Decomposition of molecular ions forming during photoionization of hydrazine and some of its alkyl derivatives

PERIODICAL: Kinetika i kataliz, v.4, no.1, 1963, 39-52

TEXT: The photoionization of the hydrazines was studied in view of discordant results reported in the literature. For all the hydrazines the photoionization mass spectra were taken at the photon energies of 10.15 eV and 11.2 eV. Relations between the ionization current and the wavelengths of the ionizing radiation were obtained for the main ions and the ionization efficiency curves constructed. The ionization and threshold potentials were obtained from the curves. For hydrazine the main ions were $N_2H_4^+$ and $N_2H_3^+$ for which the threshold ionization potentials were 8.74 ± 0.06 and 10.6 ± 0.1 eV and the heats of formation 224 and 226 kcal/mole respectively. The most intense ions for methyl-hydrazine were $CN_2H_6^+$, $CN_2H_5^+$ and $CN_2H_4^+$ with the threshold potentials of 8.0, 9.2 and 9.4 eV and the heats of formation 207, 196 and 249 kcal/mole respectively. For $(CH_3)_2N_2H_2$ the main ions were

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Decomposition of molecular ...

$C_2N_2H_8^+$, $CN_2H_5^+$ and $C_2N_2H_7^+$ with the threshold potentials of 7.67, 8.4 and 8.7 eV and the heats of formation 197, 188 and 196 kcal/mole respectively. For diethylhydrazine the main ions were $C_4N_2H_{12}^+$ and $C_3H_9N_2^+$ with the threshold potentials of 7.59 and 8.0 eV and the heats of formation 184 and 195 kcal/mole. For methyl n-butyl-hydrazine the main ions were $C_5N_2H_{14}^+$, $C_5N_2H_{13}^+$, $C_2N_2H_7^+$ and $CN_2H_5^+$ with the threshold potentials of 7.62, 8.0, 9.1 and 9.0 eV and the heats of formation 180, 164, 196 and 195 kcal/mole respectively. The energies of ionic dissociation in eV were calculated (Table 6). The excited states of the molecular ions of the hydrazines are also tabulated (Table 7). There are 7 figures and 7 tables.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet
Fizicheskiy institut (Leningrad State University
Physics Institute)

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Table 6

$R_1R_2^+$	H	CH_3	н.-C_3H_7	н.-C_4H_9	D^*
$N_2H_4^+$	2,3				(4,5)
$CH_3N_2H_3^+$	1,8	2,4			4,5
$(CH_3)_2N_2H_2^+$	2,2	1,2			4,4
$(CH_3)_2N_2H_2^+$	1,8	1,9			4,3
н.-$C_4H_9CH_3N_2H_3^+$	0,6	0,8	1,9	1,4	4,5

Table 7

(1) Ион	Нормальное состояние (2)	Возбужденные состояния (3)		
$N_2H_4^+$	8,74	—	—	11,0
$CH_3N_2H_3^+$	8,00	—	—	11,0
$(CH_3)_2N_2H_2^+$	7,67	9,5	10,5	11,0
$(C_2H_5)_2N_2H_2^+$	7,59	9,4	10,6	11,2
н.-$C_4H_9CH_3N_2H_2^+$	7,62	9,4	10,5	—

1 - Ion, 2 - normal state, eV, 3 - excited state, eV.

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10

Vilesov, F. I.

S/0048/63/027/008/0994/0995

ACCESSION NR: AP3004484

AUTHOR: Sena, L. A.

TITLE: Second All-Union Conference on the Physics of Electron and Atom Collisions [Uzhgorod, 2—9 October 1962]

SOURCE: AN SSSR. Izvestiya, ser. fiz., v. 27, no. 8, 1963, 994-995

TOPIC TAGS: conference, electron collision, atom collision, collision physics

ABSTRACT: The II Vsesoyuznaya konferentsiya po fizike elektronnykh i atomnykh stolknoveniy (Second All-Union Conference on the Physics of Electron and Atom Collisions), was held in Uzhgorod, 2—9 October 1962. The following reports were presented: "Theory of the charge-exchange process during atomic collisions," by Yu. N. Demkov; "Charge-exchange of multicharge ions," by I. P. Flaks; "Ionization due to atomic collisions," by N. V. Fedorenko; "Excitation of atoms and molecules due to electronic collisions," by L. P. Zapesochnyy; "Charge exchange and ionization during atomic collisions in the high-energy range," by V. S. Nikolayev; "Photoionization of gases and vapors by vacuum ultraviolet radiation," by Academician A. N. Terenin and F. I. Vilesov; "Effective cross sections of atomic collisions important in the theory of gaseous quantum generators," by I. I. Sobel'man; "Dissociation of molecules and ions during collisions of fast particles," by N. N. Tumitskiy; and "Corpuscular diagnostic of plasma," by V. V. Afrosimov.

ASSOCIATION: none

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L 11300-63 EWP(j)/EPF(c)/EWT(1)/EWG(k)/EWT(m)/FEC(b)-2/ES(s)-2/
BDS--AFFTC/ASD/ESD-3/SSD--Pc-h/Pr-h/Pz-h/Pt-h--RM/WW/AT/IJP(C)
ACCESSION NR: AP3003901 S/0181/63/005/007/2000/2006

92
90

AUTHOR: Vilesov, F. I.; Zagrubskiy, A. A.; Garbuzov, D. Z.

15

TITLE: Photoemission from the surface of organic semiconductors

21

SOURCE: Fizika tverdogo tela, v. 5, no. 7, 1963, 2000-2006

TOPIC TAGS: photoemission, organic semiconductor, molecular crystal, polycrystalline film, fused ring aromatic hydrocarbon, anthracene, pentacene, naphthacene, phthalocyanine, polycyclic compound, acridine, anthraquinone, aurin, indanthrenes, dimethylnitrosoaniline, chlorophyll a, scattering, photon energy, electron, photoelectron, photoelectronic work function

ABSTRACT: Electron distribution within the occupied energy band and the mechanism of photoemission have been studied in polycrystalline thin films of anthracene; pentacene; naphthacene; phthalocyanine; magnesium, aluminum, iron, and copper phthalocyanine; acridine; anthraquinone; aurin; indanthrenes (yellow and gold-orange); dimethylnitrosoaniline; and chlorophyll a. While most of the emitter films were prepared by vacuum deposition on a metallic disk, a few were deposited from solutions. The disk was illuminated with monochromatic radiation in the

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1105—1650 Å (11.2—7.5 ev) range. Emitted electrons were trapped within an evacuated spheric condenser coated inside with a conducting tin oxide film. Electron-energy distribution was evaluated by the decelerating-field method. Spectra of scattered excess of photon energy, i.e., the plots of the relative number of emitted photoelectrons versus scattered photon energy for a given quantum energy of excitation, showed that in all the fused ring aromatic hydrocarbons studied, the position and magnitude of the peaks are independent of quantum energy. Peak diffusion increases in the order: anthracene < naphthacene < pentacene. The number of slow electrons increases in the same order. Comparative analysis of photoionization potentials and absorption spectra of the compounds in the vapor and solid states led to the conclusion that ejection of π-electrons is the cause of photoemission from the surface of aromatic hydrocarbons. Agreement between experimental peak values for the scattered energy spectra and the calculated positions of the populated π-electron levels confirmed this conclusion. The first peak is located at 0.8 ev for all compounds of this class. An identical mechanism of photoemission is ascribed to phthalocyanines, , whose spectra also exhibit three peaks, at 0.8—1.0, 3, and 5.5 ev The distribution spectra of photoelectrons for aurin, indanthrenes, and chlorophyll a exhibit only one peak, which is located in the low-energy region (0.3—0.5 ev) and is independent of photon energy in the range studied. The

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photoelectronic work function for all the compounds studied was found constant in different samples and for various quantum energies of excitation. It was concluded that 1) the probability of electron ejection is nearly independent, within the error limits, of quantum energy; 2) the probability of scattering of the kinetic energy of the electrons is nearly independent of their initial energy; and 3) illumination with ultraviolet light in vacuum does not affect the thermodynamic equilibrium nor cause photochemical reactions. "In conclusion the authors take the opportunity to express thanks to Academician A. N. Terenin for his constant interest in the work and for his discussion of the results." Orig. art. has: 5 figures, and 2 tables.

ASSOCIATION: Leningradskiy gosudarstvenny*y universitet (Leningrad State University)

SUBMITTED: 29Jan63 DATE ACQ: 15Aug63 ENCL: 00

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E032/E314

5.5310

AUTHORS: Vilesov, F.I. and Akopyan, M.Ye.

TITLE: Photo-ionization and its application to analytical mass spectroscopy

PERIODICAL: Pribory i tekhnika eksperimenta, no. 5, 1962, 145 - 148

TEXT: The aim of this paper was to bring to the attention of analytical chemists and workers in mass spectroscopy, who are concerned with analytical problems, the phenomenon of photo-ionization as a method of producing low-component mass spectra in the analysis of complex organic mistures. Thus, in mass-spectroscopic analysis in which mass-produced instruments are used to analyze complex organic compounds, there are serious difficulties associated with the many forms of dissociative ionization when the ions are produced by electron impact. Photo-ionization may be a way of reducing these difficulties. As an example of the usefulness of photo-ionization, Fig. 3 shows the mass spectrum of a six-component mixture containing xylol, toluene, benzene, methyl-ethyl-ketone, acetone and ethanol,

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Photo-ionization and ....

obtained with the light from a hydrogen lamp as the ionizing agent (LiF window). Fig. 4 shows the spectrum of the same mixture with ionization by electron impact as the source of ions (E = 50 eV). From the technological point of view, the method of photo-ionization also has certain advantages, e.g. 1) more efficient ion optics may be used since the photon beam which replaces the electron beam is unaffected by electric fields, 2) the photon energy can be strictly controlled, 3) pyrolysis of the compounds under investigation at the hot cathode is avoided and 4) background peaks due to high-ionization-potential molecules (CO, CO_2, H_2O, etc.) are excluded. A disadvantage of the method is the difficulty of producing a narrow high-intensity light beam, and manufacturing windows which are transparent in the far-ultraviolet. There are 7 figures.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet
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